15. (Amended) The alternator of claim 14, wherein a tensile strength of the magnetic coating is lower than a bonding strength between the magnetic coating and a surface to which the magnetic coating is applied.

16. (Amended) The alternator of claim 15, wherein the binding material is lubricious, to facilitate any potential contact between opposing surfaces of the air gaps when the air gaps are minimized.

17. (Amended) The alternator of claim 16, wherein the binding material is an insulating material and a rust inhibitor.

REMARKS

Claims 1-18 are amended. By this Amendment, the specification and claims 1, 2 and 13-17 are amended. No new matter is added. The attached Appendix includes marked-up copies of each rewritten paragraph (37 C.F.R. §1.121(b)(1)(iii)) and claim (37 C.F.R. §1.121(c)(1)(ii)).

Applicant thanks Examiner Mullins for the courtesies extended to Applicant's representative during the January 29, 2003, personal interview. Applicant's separate record of the substance of the interview is incorporated in the following remarks.

Applicant gratefully appreciates the allowance of claims 1-12 and 18, as well as the indication of the allowable subject matter in claims 13-17 if rewritten or amended to overcome the rejection under 35 U.S.C. §112, second paragraph.

The Office Action objects to the specification because of syntax errors on pages 6, 10 and 11. The specification is amended in reply to the objection.

The Office Action also alleges that the subject matter recited on page 4, lines 7-13, page 10, lines 14-20 and the Abstract, lines 10-14 is not understood. As discussed and agreed during the personal interview, the specification is amended at page 10, lines 12-20 in reply to the objection and such amendments overcome the outstanding objections. Support for the

amendments may be found in the claims, as well as in the specification at least at page 10, lines 26- page 11, line 2. Accordingly, Applicant respectfully requests the objection to the specification be withdrawn.

The Office Action objects to claims 1, 2 and 13 because of minor informalities. Claims 1 and 2 are amended in reply to the objection. However, as discussed and agreed during the personal interview, claim 13 is not amended as the recitation of the rotor including a rotation shaft is correct and fully supported in the specification. Thus, Applicants respectfully request the objection to claims 1, 2, and 13 be withdrawn.

The Office Action rejects claims 13-17 under 35 U.S.C. §112, second paragraph. Specifically, the Office Action alleges that the recitation in claim 13 of "the core" and "the pole" on lines 11-17 lack antecedent basis. The rejection is respectfully traversed.

Claim 13 is amended to provide proper antecedent basis for "the pole". However, Applicant asserts that antecedent basis exist for "a core" in line 6 of claim 13. Furthermore, as discussed and agreed during the personal interview, claim 13 is amended in reply to the rejection and such amendments overcome the outstanding rejection.

In view of the foregoing, reconsideration of the application is requested. It is submitted that the claims as presented herein fully meet the requirements of 35 U.S.C. §112. Accordingly, allowance of claims 13-17 as well as previously allowed claims 1-12 and 18, is respectfully solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in better condition for allowance, the Examiner is invited to contact Applicant's undersigned representative at the telephone number set forth below.

Respectfully submitted,

James A. Oliff
Registration No. 27,075

John W. Fitzpatrick
Registration No. 41,018

JAO:JWF/ldg

Attachment:
Appendix

Date: January 29, 2003

OLIFF & BERRIDGE, PLC
P.O. Box 19928
Alexandria, Virginia 22320
Telephone: (703) 836-6400

DEPOSIT ACCOUNT USE AUTHORIZATION
Please grant any extension necessary for entry;
Charge any fee due to our Deposit Account No. 15-0461

APPENDIX

Changes to Specification:

Page 4, line 27-page 5, line 18:

The above mentioned rotor has a pair of rotor cores including claw portions generating N/S poles and a boss portion comprising the field winding. The pair of cores are arranged oppositely to each other at an end surface of the boss portion to form a Roundel~~roundel~~-type core. The magnetic coating is applied to at least one of the outer peripheral surfaces of the claw portions, the end surface of the boss portion, and an inner peripheral surface of the stator core. In the rotary electric machine having the ~~roundel~~Roundel-type core, the claw portions are deformed by receiving centrifugal force during rotation. Therefore, it is necessary to secure the air gap more than in other rotary electric machines. However, in the rotary electric machine of the present invention, the magnetic coating is formed on the surface of the cores which face the air gap. Therefore, in case the magnetic coating makes contact with each other or contact with the core in accordance with the rotation deformation of the rotor core, only a part of the magnetic coating is peeled and separates. Accordingly, the actual air gap can be set smaller.

Page 6, lines 7-26:

In this rotor used as a brushless generator, the claw portions are easily deformed due to centrifugal force during rotation. Therefore, it is necessary to set the air gap larger than that of a rotary electric machine having brushes. However, similar to the rotary electric machine having the ~~roundel~~Roundel-type core, the magnetic coating is formed on the surface of the core defining the air gap. Therefore, in case the magnetic member contacts other magnetic members or the core in accordance with the rotation deformation of the rotor core, only part of the magnetic coating peels and physically separates. Thus, the actual air gap can be set small.

The binding material is designed to be lubricious. Since the magnetic coating is made of a lubricated material such as grease and fills the air gap, the air gap can be substantially decreased to zero. That is, the air gap is at least minimized. Further, in the case where the rotor contacts the opposite stator core, because the magnetic coating ~~being~~ is lubricious, ~~exists so that~~ the possibility of problems such as noise or baking, is likely to be decreased. Therefore, the distance between the rotor core and the opposing stator core is shortened.

Page 10, lines 12-20:

In the present embodiment, the magnetic coating is applied on the surfaces of each member defining the above air gaps 18, 19, 20 and 21. The tensile strength of the magnetic coating on a particle is designed to be lower than that of the bonding strength of the coating on a surface of a coated member, such as the stator and/or rotor. Therefore, in the event that part of the magnetic coating on a particle is damaged by an external force, such as a contact force, the mode of breakage is not likely to be a boundary peeling on the surface of the member where the magnetic coating is applied, but breaking of the coating material on the particle results.

Page 12, line 21-page 13, line 4:

FIG. 2 is a cross-sectional view of an alternator for a vehicle which has a rotor including a ~~roundel~~Roundel-type core. The rotor 110 has a pair of rotor cores each of which includes claw pieces 100 producing N/S poles and a boss portion 102 having the rotor windings therearound. In this structure, two air gaps are formed on a main magnetic flux route generated by the field winding. One air gap is defined between the claw pieces 100 and an inner peripheral surface of the stator 120, and the other air gap is defined between opposing surfaces of the pair of boss portions 102. Therefore, the magnetic coating may be applied to the members which face the above air gaps.

Changes to Claims:

The following is a marked-up version of the amended claims:

1. (Amended) A rotary electric machine, comprising:

a rotor including a rotor core that alternately generates north and south poles in a circumferential direction and a field winding wound around the rotor core;

a stator including a stator core arranged opposite to the rotor core and a stator coil wound around the stator core; and

a frame supporting the rotor and the stator,

~~wherein~~ a magnetic coating made of magnetic particles and binding material binding the magnetic particles is formed on at least one of opposite surfaces of the stator and the rotor~~;~~ and

~~wherein~~ a tensile strength of the magnetic coating is set smaller than a bonding strength between the magnetic coating and a surface where the magnetic coating is formed.

2. (Amended) The rotary electric machine of claim 1,

wherein the rotor includes a pair of rotor cores, each of which includes claw portions generating north and south poles and a boss portion having a rotor winding therearound;

wherein the pair of rotor cores forms a ~~roundel~~Roundel-type core and is arranged opposite to each other at an end surface of the boss portion; and

wherein the magnetic coating is applied to at least one outer peripheral surface of the claw portions, the end surface of the boss portion and an inner peripheral surface of the stator core.

13. (Amended) An alternator for a vehicle, the alternator comprising:

a frame supporting a rotor and a stator;

wherein the frame has a front bracket and a rear bracket, the front and rear brackets securing the stator and the rotor therebetween;

wherein the rotor includes a rotation shaft, a core, a first pole, a second pole, a ring, a field core, a field winding bobbin, and a field winding;

wherein the stator includes a stator core, and a stator coil;

wherein the field core and the core define a first air gap, the core and the first pole define a second air gap, the first pole and the stator define a third air gap, the stator and the second pole further define the third air gap, and the second pole and the field core define a fourth air gap; and

wherein a magnetic coating is applied on at least one of the field core or the core, which define the first air gap.

14. (Amended) The alternator of claim 13,-

——————wherein the magnetic coating is made of magnetic particles and a binding material to bind the magnetic particles.

15. (Amended) The alternator of claim 14,-

——————wherein a tensile strength of the magnetic coating is lower than a bonding strength between the magnetic coating and a surface to which the magnetic coating is applied.

16. (Amended) The alternator of claim 15,-

——————wherein the binding material is lubricious, to facilitate any potential contact between opposing surfaces of the air gaps when the air gaps are minimized.

17. (Amended) The alternator of claim 16,-

——————wherein the binding material is an insulating material and a rust inhibitor.